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10/817,104	04/01/2004	Youval Nehmadi	6317P077	2893

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EXAMINER	
LEVIN, NAUM B	

ART UNIT	PAPER NUMBER
2825	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/817,104	NEHMADI ET AL.	
	Examiner	Art Unit	
	NAUM B. LEVIN	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to application 10/817,104 and Response filed on 07/30/2008. Claims 1-48 remain pending in the application.

2. The Examiner finds Applicant's arguments on the application of Kitamura as none persuasive. Kitamura's reference reads on the claims 1-48 as presently written.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: photolithography process monitoring system and method.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1 and 24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed invention lacks patentable utility.

The terms "receiving design information", "processing the received design information" and "associating target measurement parameters to each of large number of measurement targets" in the claim do not show any functional descriptive materials for getting the utility output, therefore they are missing the patentable utilities.

The claim appears to use functions or definitions without providing a useful, concrete and tangible result.

5. Claims 1 and 24 also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either an asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: providing design information representative of a portion of a layer of an object that comprises sub-micron measurement targets. It is also unclear what/who provides above design information.

7. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: device for providing design information representative of a portion of a layer of an object that comprises sub-micron measurement targets. It is also unclear who/what device provides above design information.

Claim Objections

8. Claims 1 and 24 are objected to because following informalities:

9. Applicant must clarify what is "processing the received design information".

10. Applicant must clarify what is "a large number of measurement targets".

11. Applicant must clarify what is "target measurement parameters".

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-48 are rejected under 35 U.S.C. 102(e) as being unpatentable by Kitamura et al. (US Publication No.: 20050146714).

13. As to claims 1 and 24 Kitamura discloses:

Claim 1 A method, comprising:

receiving design information representative of a portion of a layer of an object that comprises sub-micron measurement targets (As best understood, an image acquisition device 317 receives a pattern image to-be-inspected and transfers it to control computer 350 – paragraph 342, Fig.1; FIG. 10 is a diagram showing an

example of a pattern image to-be-inspected. As shown in FIG. 10, the pattern image to-be-inspected may have a bridge defect, a particle defect, and a deformation within an allowable pattern deformation quantity. Especially, corners have big corner roundness – paragraph 333, Figs.10-11);

processing the received design information to provide a large number of measurement targets (As best understood, in the first inspection/measurement processing, the first edges/large number of **measurement targets** are detected from the pattern image to-be-inspected/measured – paragraph 334; Fig. 11; a detecting device configured to detect/processing an edge of the image of the pattern to-be-inspected, and an inspection device configured to inspect the pattern to-be-inspected, wherein one of the reference patterns which exists on the boundary of periodical patterns is recognized as a unique pattern, the unique pattern is shifted by one period/processing – paragraph 74); **and**

associating target measurement parameters to each of large number of measurement targets (The CD-SEM automatically measures a line width/parameters of a line-shaped pattern/each of large number of measurement targets in a specified position/associating using a line profile – paragraphs 18; 851; Figs. 111A-111D; In a preferred aspect of the present invention, the inspection using a plurality of the edges includes inspection of a line width of a line-shaped pattern, a space width of a line-shaped pattern, a line width of a curvilinear-shaped pattern/corner, a space width of a curvilinear-shaped pattern/corner/target measurement parameters – paragraph 54);

Claim 24 A system, comprising:

an interface (input/output control part 3 - Figs. 15-16) **for receiving design information representative of a portion of a layer of an object that comprises sub-micron measurement targets** (As best understood, an image acquisition device 317 receives a pattern image to-be-inspected and transfers it to control computer 350 – paragraph 342, Fig.1; FIG. 10 is a diagram showing an example of a pattern image to-be-inspected. As shown in FIG. 10, the pattern image to-be-inspected may have a bridge defect, a particle defect, and a deformation within an allowable pattern deformation quantity. Especially, corners have big corner roundness – paragraph 333, Figs.10-11);

a processor (main control unit (cpu) 1 - Figs. 15-16) **for processing the received design information to provide a large number of measurement targets**(As best understood, in the first inspection/measurement processing, the first edges/large number of **measurement targets** are detected from the pattern image to-be-inspected/measured – paragraph 334; Fig. 11; a detecting device configured to detect/processing an edge of the image of the pattern to-be-inspected, and an inspection device configured to inspect the pattern to-be-inspected, wherein one of the reference patterns which exists on the boundary of periodical patterns is recognized as a unique pattern, the unique pattern is shifted by one period/processing – paragraph 74);

a processor coupled to the interface (Figs. 15-16) **for associating target measurement parameters to each of large number of measurement targets** (The CD-SEM automatically measures a line width/parameters of a line-shaped pattern/each

of large number of measurement targets in a specified position/associating using a line profile – paragraphs 18; 851; Figs. 111A-111D; In a preferred aspect of the present invention, the inspection using a plurality of the edges includes inspection of a line width of a line-shaped pattern, a space width of a line-shaped pattern, a line width of a curvilinear-shaped pattern/corner, a space width of a curvilinear-shaped pattern/corner/target measurement parameters – paragraph 54).

14. As to claims 2-23 and 25-48 Kitamura recites:

Claims 2-3, 25-26 The method/system, wherein the measurement parameters comprise location information representative of a location of the measurement site (paragraphs 340-342, 522, 539, 578);

Claims 4, 27 The method/system, wherein the measurement parameters comprise a measurement field of view (paragraphs 392, 403, 447);

Claims 5, 28 The method/system, wherein the measurement parameters comprise an electron beam parameter (paragraphs 104, 313, 376);

Claims 6-7, 9, 29-30, 32 The method/system, wherein the step of associating target measurement parameters comprises determining a presence of a unique feature within a measurement site that comprises a measurement target (paragraphs 542-554, Fig.58);

Claims 8, 31 The method/system, wherein said processing comprises applying auto-correlation operation (paragraph 504);

Claims 10, 33 The method/system further comprising grouping measurements located within a field of view of a measurement tool (paragraphs 597. 818);

Claims 11, 34 The method/system, wherein the stage of processing comprising selecting measurement targets associated with optical proximity correction (paragraphs 751-754);

Claims 12, 14, 35, 37 The method/system further comprising measuring the large number of measurement targets to provide measurement results (paragraphs 18, 19, 604, 637);

Claims 13, 36 The method/system, wherein the stage of measuring comprises scanning measurement targets with an electron beam (paragraph 1056);

Claims 15-18, 20, 41-46, 48 The method/system further comprising processing the measurement results to provide an indication about the fabrication process (paragraphs 5, 51, 335, 395, 601);

Claims 19, 47 The method/system, wherein the processing comprises determining optimal design features (paragraph 522);

Claims 21, 38 The method/system, wherein the stage of measurement comprising a stage of locating a vicinity/space width of a measurement target (paragraphs 54, 187, 295-296, 499-500);

Claims 22-23, 39-40 The method/system, wherein the stage of providing a large number of measurement targets further comprises locating auto focus targets (paragraphs 235, 440, 966, 973, 976, 984).

REMARKS

15. Examiner defined Applicant's arguments as none persuasive, a new mapping of Kitamura's reference is shown in above rejections. For these reasons shown above the prior rejections are maintained. However, Applicants' arguments are to look are well taken.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAUM B. LEVIN whose telephone number is (571)272-1898. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Naum Levin/
Examiner
Art Unit 2825